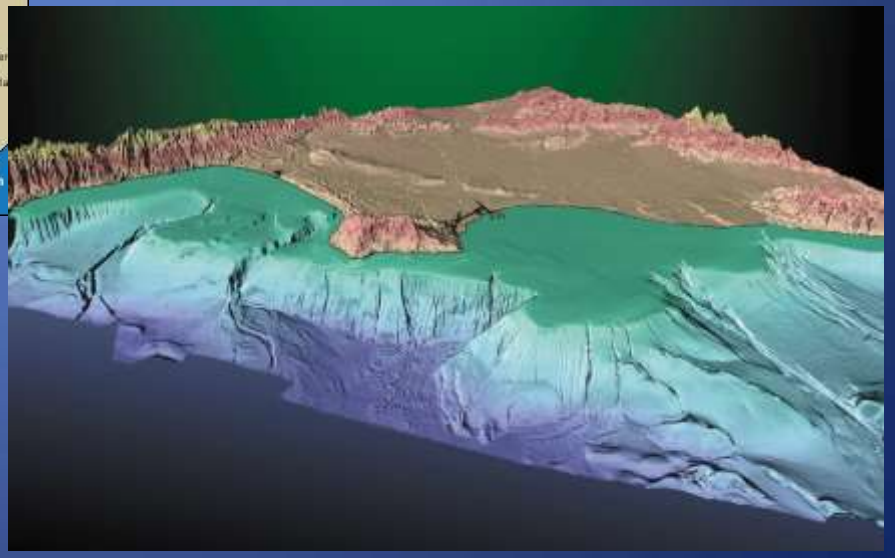
Santa Monica Bay
National Estuary Program

State of the Bay

2015

Geographic Setting

Santa Monica Bay and its Watersheds



- 400 sq. mile watershed and coastal ocean
- 20 cities in the watershed
- 80+ cities in the wasteshed

Purpose of the Report

- Measure progress implementing the Bay Restoration Plan
- Educate the public about the Bay's valuable natural resources
- Identify and help scientists and managers to remaining and emerging challenges

Structure of the Report

- Feature articles and sidebars written by TAC members and invited experts on topics represent the most current and pressing issues.

- Habitat assessment using a standardized framework and a set of comparable indicators.

Main Sections of the Report

- Water Resources
  - Water supply, use, and quality
- Habitat Conditions
  - Status and trends of seven major habitats
- Looking Ahead
  - Climate change, natural habitats in urban environment, sediment management, advance in bacterial monitoring, nutrients and harmful algal blooms

Water Resources

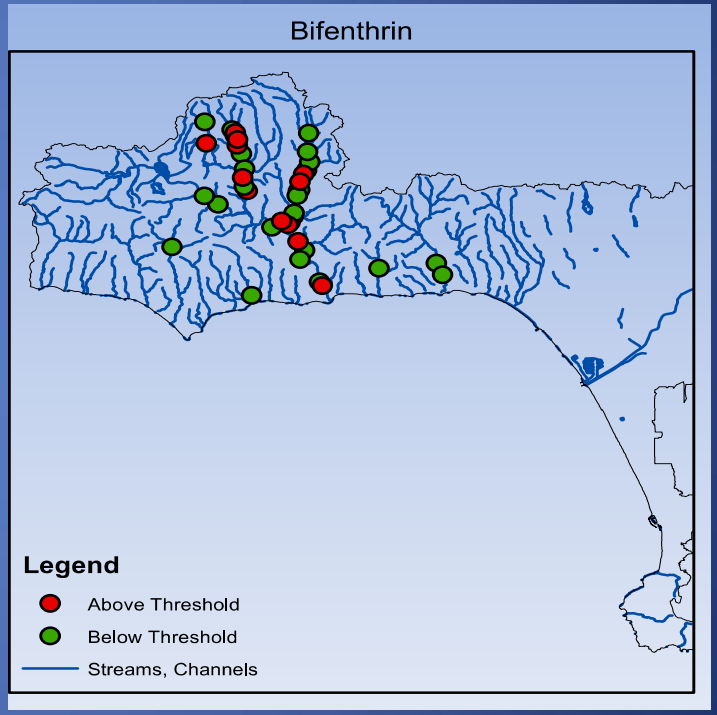
- One Water – a new approach to coordinate across agencies on aspects of water supply, use, and disposal
- Shift from traditional (imported) to non-traditional sources
  - Conservation
  - LID and Rainwater harvesting
  - EWMP and stormwater harvesting
  - Groundwater treatment
  - Greywater reuse
  - Wastewater reclamation
  - Desalination

Water Quality

- 14 TMDLs enacted (four in the past 5 years) to address trash, bacteria, and toxics in multiple locations throughout the Bay
- Millions of dollars in state and local funds have been invested to implement pollution control projects
  - SMBNEP allocated more than $28 million for 36 capital projects
- The Bay is cleaner with less trash, bacterial, and toxics contamination as a result of these efforts
  - Decreased sewage spills and improved beach water quality
  - Bay sediments no longer have adverse impacts on aquatic life, although seafood contamination is still an issue
  - Over 96% compliance with the Ballona Creek Trash TMDL in 2014
  - Less trash found on Santa Monica Bay beaches

Water Quality

- New Issues and Challenges - Contaminants of Emerging Concern (CECs)
  - Include: new pesticides, pharmaceuticals, personal care products, and manufacturing compounds
  - New strategies are being developed to manage and regulate CECs
  - Challenge in identifying and limiting the use of problematic CECs



Habitat Conditions

Seven major types of habitat

- Freshwater Aquatic Habitat
- Coastal Wetlands
- Beaches and Dunes
- Rocky Intertidal Habitat
- Rocky Reefs
- Soft bottom Benthos
- Coastal Pelagic Habitat

Approach for the 2015 Assessment

A new framework using a set of comparable indicators in four categories across habitat types

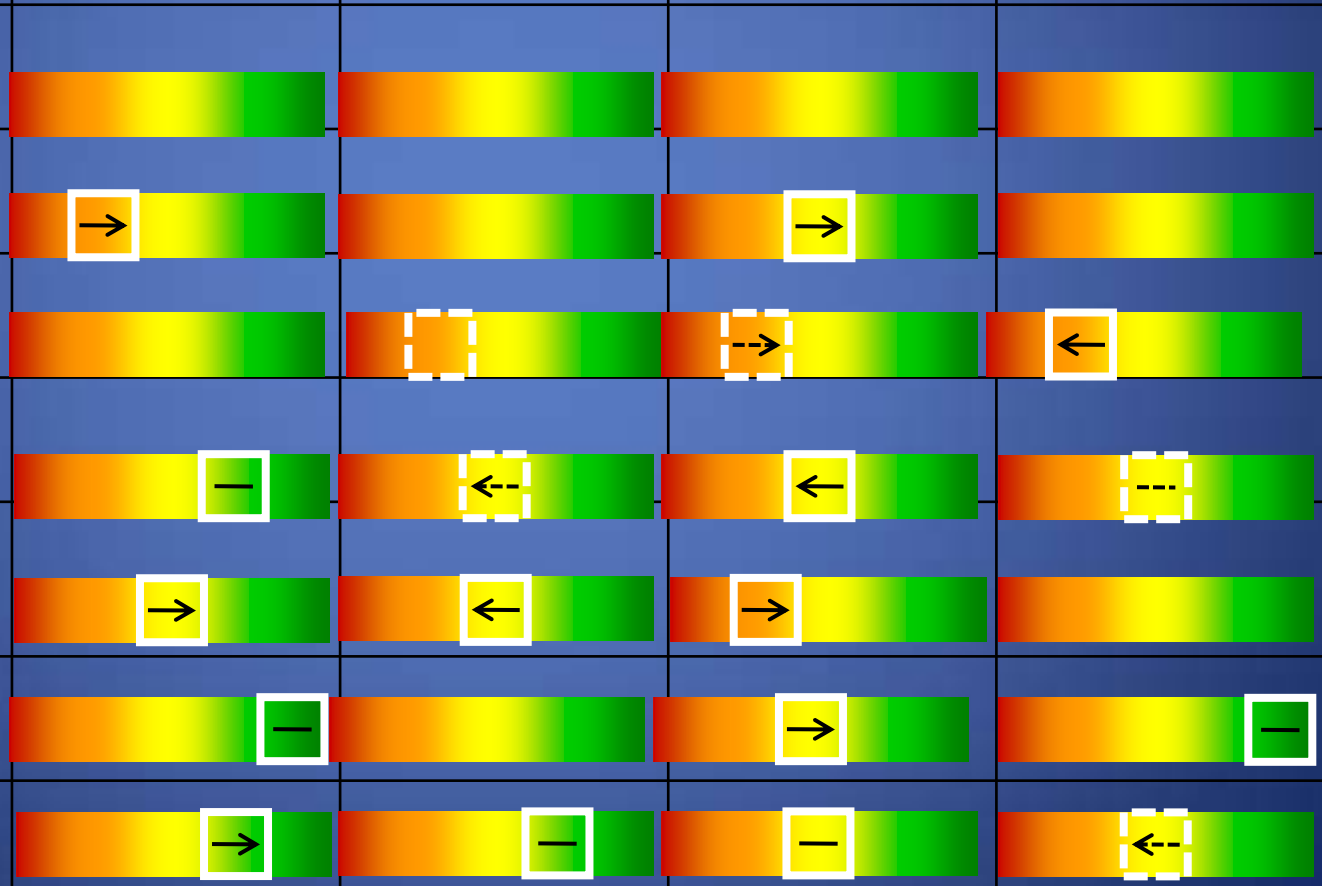
- Habitat extent
- Vulnerability
- Structure and disturbance
- Biological responses

Indicator Scores

Status	**Trend**	**Confidence**
Good	Increasing	High
Fair	Constant	Moderate
Poor	Decreasing	Low

Indicator Scores

Habitat	Extent	Vulnerability	Structure & Disturbance	Biological Response
Freshwater Aquatic Habitat				
Coastal Wetlands and Lagoons				
Beaches and Dunes				
Rocky Intertidal Habitat				
Rocky Reef Habitat				
Soft Bottom Benthos				
Coastal Pelagic Habitat				



Overall Findings

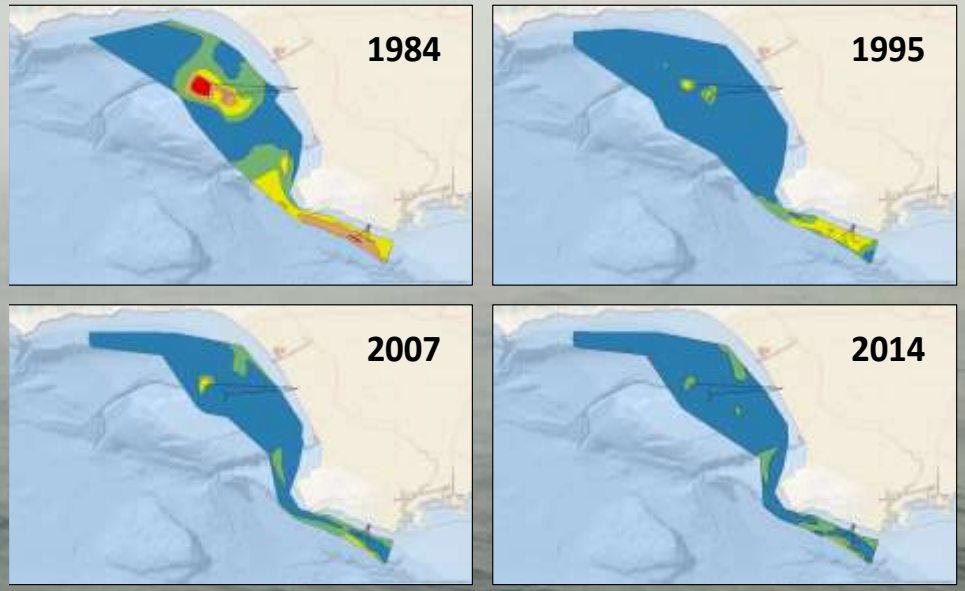
- Most habitats in most areas are degraded to some degree due to human disturbances.
- There are areas of improvement because of restoration efforts at Malibu Lagoon and in kelp forests in the Bay.
- There are concerns that the conditions of some habitats are still in decline, such as rocky intertidal habitat**s,** due to intensive human trampling and collecting activities.

Soft Bottom

Extent | Vulnerability | Structure & Disturbance | Biological Responses

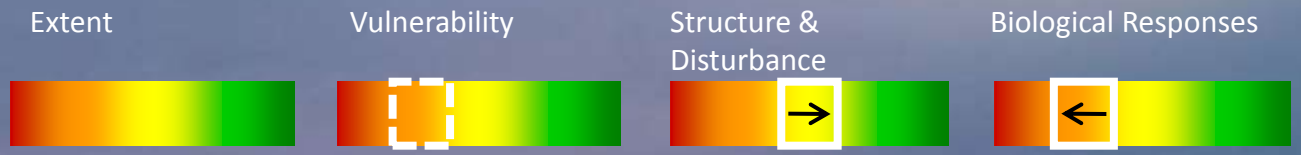
- The physical, chemical, and biological properties continue to improve, primarily due to the continuous shrinking of surface areas with high level of chemical contamination.
- The condition of the biological community as measured by benthic response index is good. Values are at reference condition in over 85% of the area.

Benthic Response Index Values



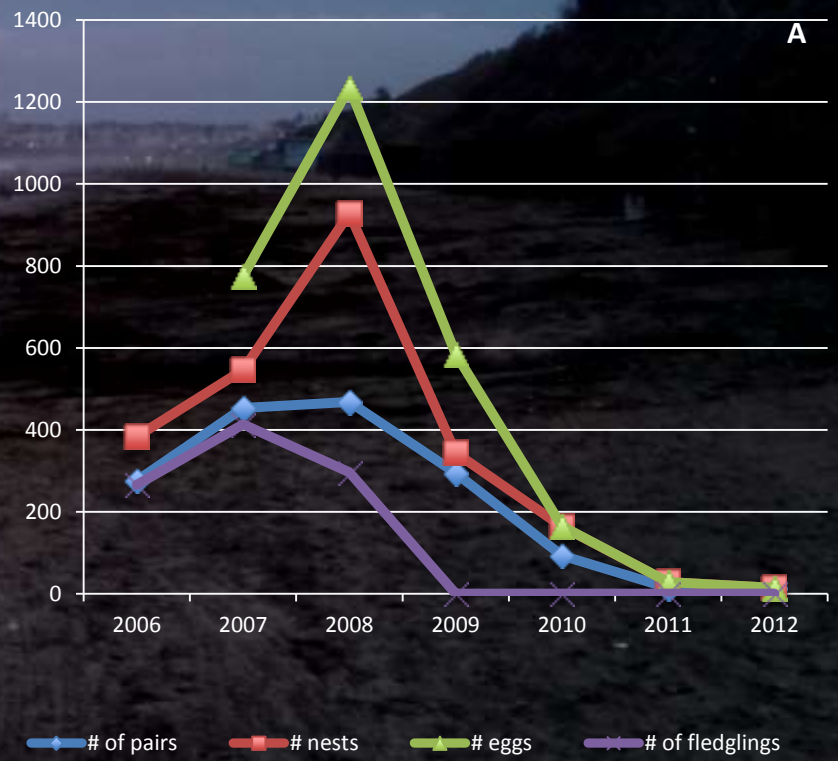
Area coverage in percentage				Benthic Response Index (BRI) Threshold Intervals		
1984	1995	2007	2014			
1.6%	0.0%	0.0%	0.0%		>=72	Defaunation
7.9%	0.2%	0.0%	0.0%		44-71	Loss of community function
13.7%	5.1%	1.5%	0.4%		34-43	Loss of biodiversity
26.0%	6.1%	13.4%	12.1%		26-33	Marginal deviation from reference
50.7%	88.7%	85.1%	87.2%		<=25	Reference conditions

Sandy Shores (Beach & Dunes)

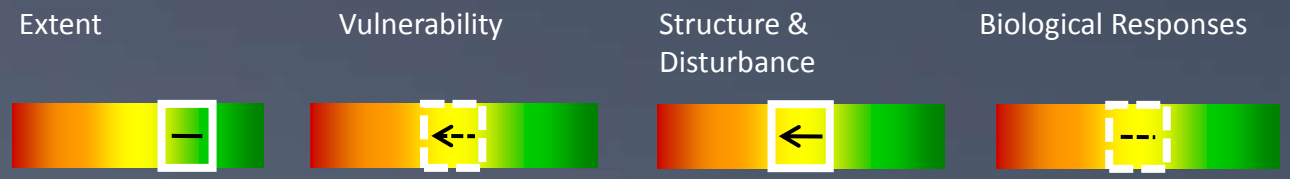


- Overall condition is POOR
- Beach grooming and coastal armoring are major stressors
- Bird nursing and roosting success rate declined.
- Grunion runs have declined in the Bay and throughout their range.
- Beach managers are adopting new grooming practices

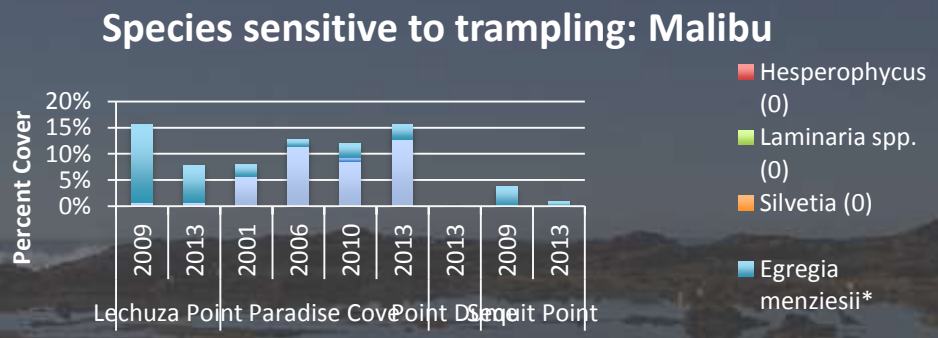
Least Tern Nesting Success at the Venice Beach Colony

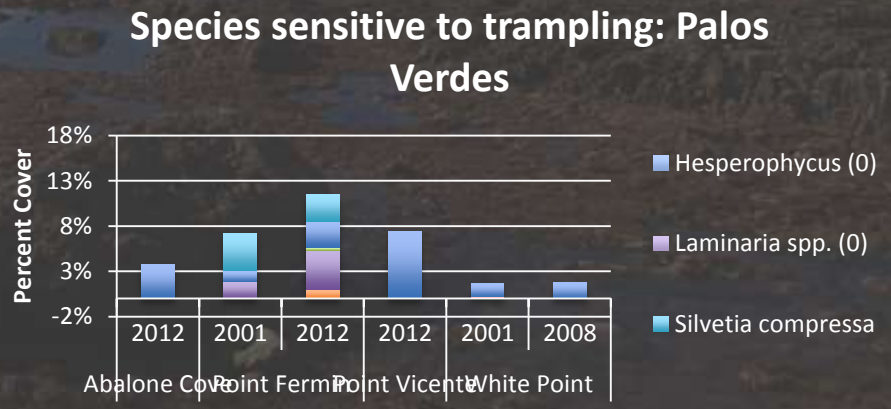


Rocky Intertidal



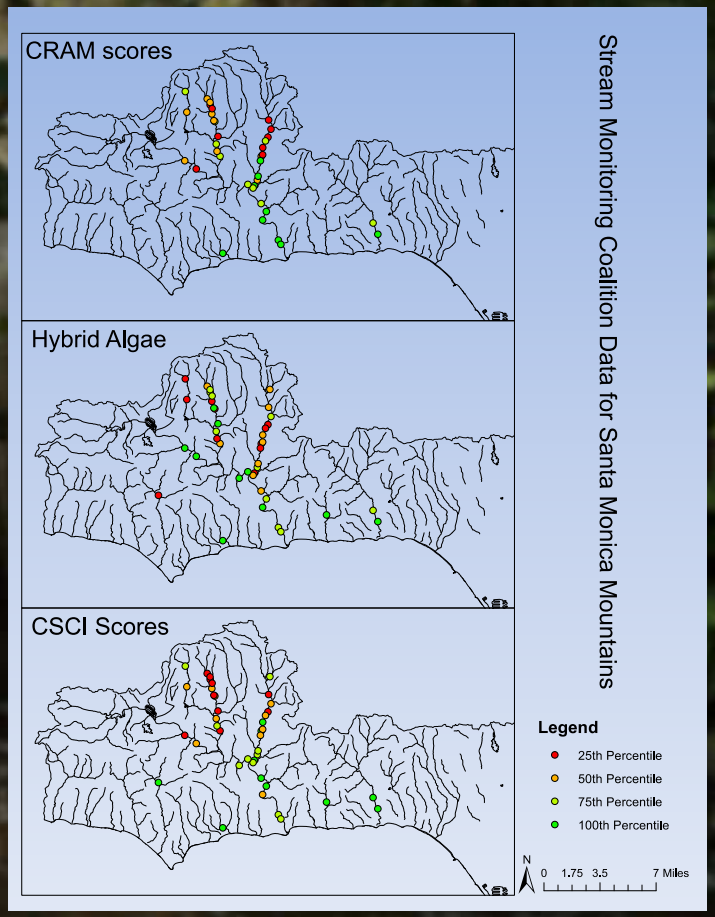
- Human trampling and collecting activities impose the greatest pressure and impacts throughout the Bay.
- Condition is declining but habitat in the north is better due to less human disturbance
- Local populations of sea stars have completely disappeared due to wasting disease.



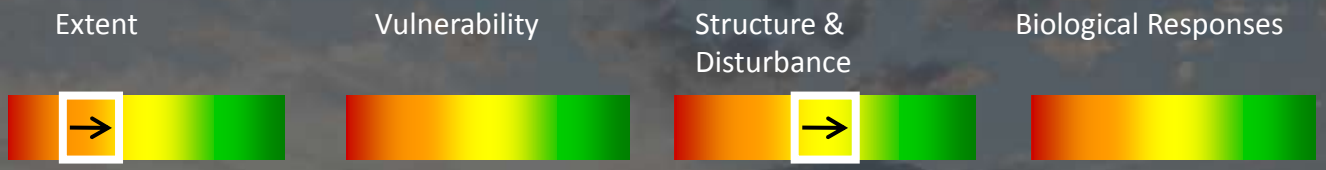


Freshwater Aquatic Habitat

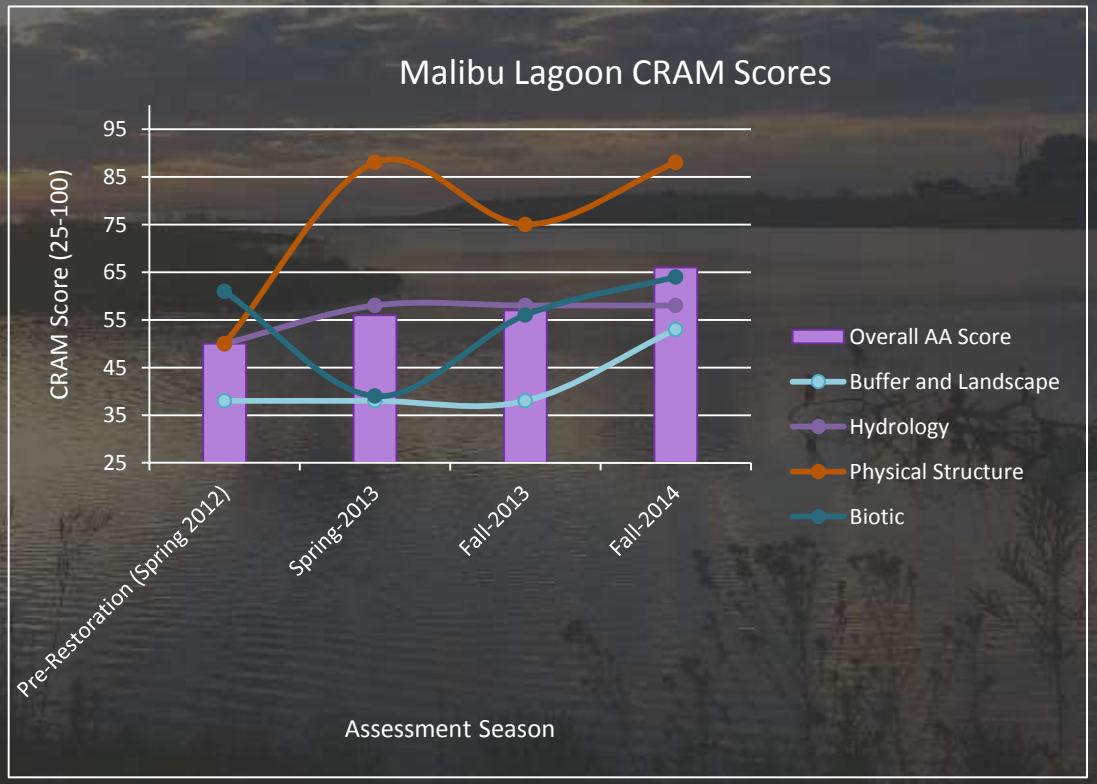
- No scoring
- Case study - 20% are severely degraded. Sites in Malibu Creek generally have the lowest condition based on benthic invertebrates.
- A restoration effort for red-legged frogs in the Santa Monica Mountains is underway following the reintroduction of these frogs at two locations.
- Small dams and culverts are being removed, making miles of habitat available for steelhead.



Coastal Wetlands and Lagoons



- More than 90% decline in the area of estuarine habitat in the watershed over the last 150 years
- Condition differ from wetland to wetland, with scores improving at Malibu Lagoon as a result of the restoration



Other Features and Messages

- Marine Protected Areas:
  - Four Marine Protected Areas (MPAs) took effect in January 2012.
  - Efforts focus on outreach, education, and enforcement.
  - Initial monitoring results indicate certain extent of compliance by commercial and recreational fishermen in the Bay
- Endangered Species:
  - 41 species were listed as federally or state endangered or threatened species in the Bay watershed
  - Red-legged frogs is being reintroduced in the Santa Monica Mountains
- Fisheries
  - Commercial fishing in the Bay primarily targets market squid, pacific sardine, red sea urchin, spiny lobster, hagfish, and thornyheads
  - Improved fishery management plans, data collection, and stock assessments for these species are critical.

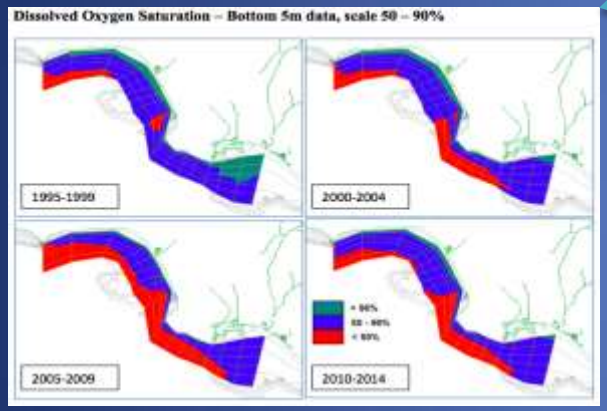
Looking Ahead

- Integrated water resource management - TOP PRIORITY
- New tools, methods, and technology
  - Faster methods for measuring FIB
- Protecting natural ecosystem in the Santa Monica Mountains and other urban watersheds through land use planning
- A holistic, regional approach in sediment management

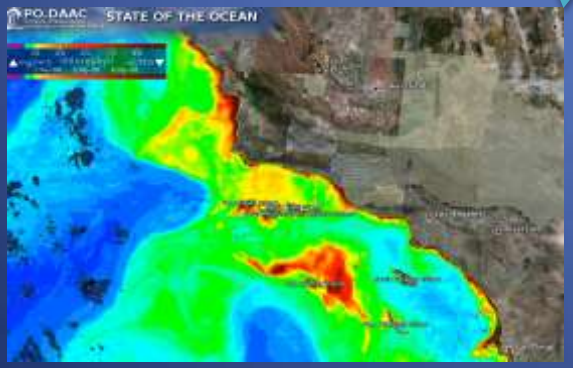
Looking Ahead

Nutrient Loading

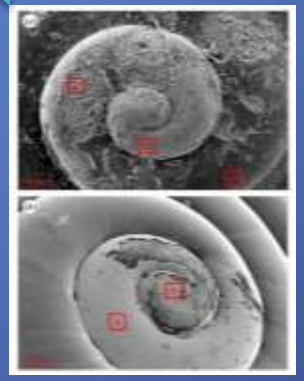
Upwelling & Hypoxia



Harmful Algal Bloom



Ocean Acidification



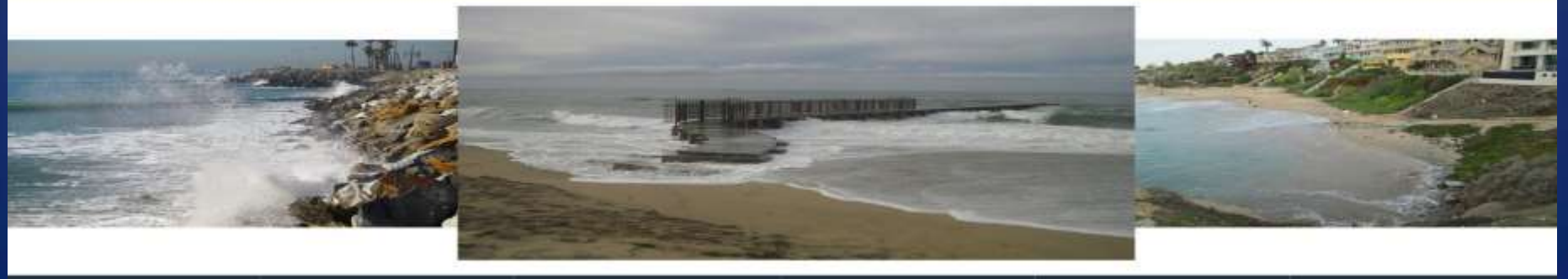
Cyanotoxin

Looking Ahead

Climate Change

Significant impacts on the Santa Monica Bay and its watershed may result from:

- sea level rise
- storm surge
- ocean acidification
- increases in water temperature
- changes in local weather patterns



Looking Ahead

Climate Change

- **Adaptation Planning Efforts:**
  - Regional AdaptLA: development of a comprehensive shoreline change and coastal erosion model and adaptation strategies
  - Vulnerability assessment of BRP to ensure that our work addresses the stressors of climate change

Acknowledgement

- TAC Members:
  - **Rich Ambrose** (Chair), UCLA
  - **Steve Bay** (Vice Chair), Southern California Coastal Water Research Project
  - **Mas Dojiri**, City of LA Environmental Monitoring Division
  - **John Dorsey**, Loyola Marymount University
  - **Rainer Hoenicke**, Delta Stewardship Council
  - **Karen Martin**, Pepperdine University
  - **Dan Pondella**, Occidental College, Vantura Research Group
  - **Eric Stein**, Southern California Coastal Water Research Project

Questions?